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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,459	12/17/2003	James M. Tour	11321-P060US	9579
7590 Ross Spencer Garsson 400 North Ervay Street P.O. Box 50784 Dallas, TX 75201			EXAMINER WONG, EDNA	
			ART UNIT 1753	PAPER NUMBER
			MAIL DATE 05/24/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Advisory Action</b> <b>Before the Filing of an Appeal Brief</b>	<b>Application No.</b> 10/738,459	<b>Applicant(s)</b> TOUR ET AL.	
	<b>Examiner</b> Edna Wong	<b>Art Unit</b> 1753	

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 14 May 2007 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☐ The period for reply expires \_\_\_\_\_ months from the mailing date of the final rejection.  
 b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

#### AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
 (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);  
 (b) ☐ They raise the issue of new matter (see NOTE below);  
 (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
 (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

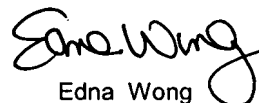
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
 5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.  
 6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
 7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
 The status of the claim(s) is (or will be) as follows:  
 Claim(s) allowed: \_\_\_\_\_.  
 Claim(s) objected to: \_\_\_\_\_.  
 Claim(s) rejected: 1-27.  
 Claim(s) withdrawn from consideration: \_\_\_\_\_.

#### AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
 9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
 10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

#### REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
See pages 2-24.  
 12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_  
 13. ☐ Other: \_\_\_\_\_.

  
 Edna Wong  
 Primary Examiner  
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### ***ADVISORY ACTION***

This is in response to the Amendment After Final dated May 14, 2007.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Response to Arguments***

#### **Double Patenting**

I. Claims **1-27** have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. **10/764,092**.

The rejection of claims 1-27 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 10/764,092 is as applied in the Office Actions dated September 29, 2005, March 28, 2006, September 12, 2006 and March 14, 2007 and incorporated herein. The rejection has been maintained for the following reasons:

The provisional double patenting rejection is not the only rejection remaining in the Application.

II. Claims **1-27** have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 of copending Application No. **10/738,168**.

The rejection of claims 1-27 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 of copending Application No. 10/738,168 is as applied in the Office Actions dated September 29, 2005, March 28, 2006, September 12, 2006 and March 14, 2007 and incorporated herein. The rejection has been maintained for the following reasons:

The provisional double patenting rejection is not the only rejection remaining in the Application.

Claim Rejections - 35 USC § 102/103

I. Claims **1-4 and 7** have been rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Harutyunyan et al.** (US Patent No. 7,014,737 B2).

102(e)

The rejection of claims 1-4 and 7 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Harutyunyan et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the following reasons:

Applicants state that Harutyunyan does not teach crosslinking carbon nanotubes, but rather the purification of carbon nanotubes. Harutyunyan achieves the purification of nanotubes by localized heating of the residual metal particle catalyst (which may be encased in carbon shells) with microwave

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radiation.

In response, the Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that an anticipation rejection of a claim under 35 U.S.C. §102(e) requires identity of invention; each and every feature of the claim must be identified by the Examiner, either explicitly or inherently, in a single prior art reference.

In response, the Examiner has identified where each and every feature of the claim, either explicitly or inherently, is in the single prior art reference (see pages 5-6 of the Office Action dated March 14, 2007).

Applicants state that to establish inherency, extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the device or system described in the reference, and that it would be so recognized by persons of ordinary skill in the art. *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed.

Cir. 1999).

In response, since Harutyunyan teaches exposing the crude reaction product comprising carbon nanotubes and the residual catalyst particles to microwave radiation (col. 7, lines 60-67). This reads on the step of irradiating the provided carbon nanotubes with microwaves as presently claimed, being that the claim limitation of "to yield a plurality of crosslink carbon nanotubes" is a result of performing this step and does not contribute to the operation of the irradiating. Thus, one having ordinary skill in the art would have expected that similar processes can reasonably be expected to yield products which inherently have the same properties.

Furthermore, the missing descriptive matter is not a claim limitation that contributes to the operation of the irradiating step.

Applicants state that inherency may not be established by probabilities or possibilities; the mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency. *Scaltech, Inc. v. Retech/Tetra L.L.C.*, 156 F.3d 1193, 51 USPQ.2d 1055 (Fed. Cir. 1999).

In response, Harutyunyan teaches the technical features necessary for achieving Applicants' desired result.

103(a)

Applicants state that modification of the Harutyunyan's procedure to

crosslink carbon nanotubes would teach away from this very purpose.

In response, when Applicants claims a composition in terms of function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the Examiner may make a rejection under both 35 USC 102 and 103, expressed as a 102/103 rejection. This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic (MPEP § 2112(III)).

Applicants claim a method in terms of function, property or characteristic and the method of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference. The Examiner does not deem that the function, property or characteristic, i.e., the claim limitation of "to yield a plurality of crosslink carbon nanotubes", makes the method claims novel because the result of the method does not make the method steps or maneuvers themselves novel.

Applicants state that the Examiner is reminded that a proposed modification cannot change the principle of operation of the prior art being modified, nor can the proposed modification render the prior art unsatisfactory for its intended purpose.

In response, Harutyunyan teaches exposing the crude reaction product comprising carbon nanotubes and the residual catalyst particles to microwave

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radiation (col. 7, lines 60-67). This reads on the step of irradiating the provided carbon nanotubes with microwaves as presently claimed.

The exposing step of Harutyunyan is not modified, and thus, its principle of operation is not changed.

The Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that Harutyunyan fails to teach all the elements of the present invention. For these reasons, the Examiner has not established a *prima facie* case of obviousness.

In response, there is no requirement that all of the elements of the present invention has to be explicitly disclosed by the reference to established a *prima facie* case of obviousness. References are evaluated by what they collectively suggest to one versed in the art, rather than by their specific disclosures. *In re Simon* 174 USPQ 114 (CCPA 1972); *In re Richman* 165 USPQ 509, 514 (CCPA 1970).



Applicant state that the statement made by the Examiner that the Applicant is only defining the subject matter in terms of the results to be achieved...without providing the technical features necessary for achieving the result. The desired result is crosslinked carbon nanotubes. This is achieved by 1) starting with carbon nanotubes and 2) irradiating them with microwaves as stated clearly in claim 1. Irradiation of carbon nanotubes with microwaves is the technical feature that solves the problem of how to crosslink the carbon nanotubes.

In response, Harutyunyan teaches exposing the crude reaction product comprising carbon nanotubes and the residual catalyst particles to microwave radiation (col. 7, lines 60-67). This reads on the 1) starting with carbon nanotubes and 2) irradiating them with microwaves. Thus, Harutyunyan teaches the technical features necessary for achieving Applicants' desired result.

**II. Claims 8-9, 11-15 and 18** have been rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Harutyunyan et al.** (US Patent No. 7,014,737 B2).

The rejection of claims 8-9, 11-15 and 18 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Harutyunyan et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained reasons as discussed above.

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Applicants' remarks have been fully considered but they are not deemed to be persuasive.

III. Claims **19, 21-24 and 27** have been rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Harutyunyan et al.** (US Patent No. 7,014,737 B2).

The rejection of claims 19, 21-24 and 27 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Harutyunyan et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed to be persuasive.

IV. Claims **1 and 7** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **WO 01/75903** ('903).

The rejection of claims 1 and 7 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 01/75903 ('903) is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the following reasons:

*102(b)*

Applicants state that the '903 publication does not teach crosslinking CNTs, but rather teaches conducting materials containing both nanostructures (including CNTs) AND a charge-transfer agent that is able to transfer charge between itself and the nanostructure.

In response, the Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that the '903 patent is not providing carbon nanotubes as disclosed in claim 1 of the present invention. That is, the '903 patent provides a modified carbon nanotube with a charge transfer agent as part of a conducting material, thus changing the properties of the carbon nanotubes, including the CNTs behavior when subjected to microwave radiation. Thus, although the '903 publication teaches irradiating with microwaves, the CNTs have been modified to behave as conductors and no crosslinking is observed.

In response, the claims as presently written recite "carbon nanotubes". The carbon nanotubes read on modified carbon nanotubes. The behavior of the

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carbon nanotubes, whether modified or not, does not distinguish the method as presently written from the prior art because the Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that an anticipation rejection of a claim under 35 U.S.C. §102(e) requires identity of invention; each and every feature of the claim must be identified by the Examiner, either explicitly or inherently, in a single prior art reference.

In response, the Examiner has identified where each and every feature of the claim, either explicitly or inherently, is in the single prior art reference (see pages 11-12 of the Office Action dated March 14, 2007).

Applicants state that to establish inherency, extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the device or system described in the reference, and that it would be so recognized by persons of ordinary skill in the art. *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed.

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Cir. 1999).

In response, since WO '903 teaches using electromagnetic radiation, such as microwaves or light to irradiate nanostructures, excited electrons are produced (page 9, lines 19-20). This reads on the step of irradiating the provided carbon nanotubes with microwaves as presently claimed, being that the claim limitation of "to yield a plurality of crosslink carbon nanotubes" is a result of performing this step and does not contribute to the operation of the irradiating. Thus, one having ordinary skill in the art would have expected that similar processes can reasonably be expected to yield products which inherently have the same properties.

Furthermore, the missing descriptive matter is not a claim limitation that contributes to the operation of the irradiating step.

Applicants state that inherency may not be established by probabilities or possibilities; the mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency. *Scaltech, Inc. v. Retech/Tetra L.L.C.*, 156 F.3d 1193, 51 USPQ.2d 1055 (Fed. Cir. 1999).

In response, WO '903 teaches the technical features necessary for achieving Applicants' desired result.

103(a)

Applicants state that modification of the '903 publication to crosslink

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carbon nanotubes would teach away from this very purpose, since it would require the removal of the charge transfer agent, the very element required to alter the conductive properties of the CNTs.

In response, the claims as presently written recite "carbon nanotubes". The carbon nanotubes read on carbon nanotubes doped with a charge transfer agent. The behavior of the carbon nanotubes, whether doped or not, does not distinguish the method as presently written from the prior art because the Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that the Examiner is reminded that a proposed modification cannot change the principle of operation of the prior art being modified, nor can the proposed modification render the prior art unsatisfactory for its intended purpose.

In response, WO '903 teaches using electromagnetic radiation, such as microwaves or light to irradiate nanostructures, excited electrons are produced (page 9, lines 19-20). This reads on the step of irradiating the provided carbon

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nanotubes with microwaves as presently claimed.

The irradiating step of WO '903 is not modified, and thus, its principle of operation is not changed.

The Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that WO '903 fails to teach all the elements of the present invention. For these reasons, the Examiner has not established a *prima facie* case of obviousness.

In response, there is no requirement that all of the elements of the present invention has to be explicitly disclosed by the reference to established a *prima facie* case of obviousness. References are evaluated by what they collectively suggest to one versed in the art, rather than by their specific disclosures. *In re Simon* 174 USPQ 114 (CCPA 1972); *In re Richman* 165 USPQ 509, 514 (CCPA 1970).

Applicant state that the statement made by the Examiner that the

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Applicant is only defining the subject matter in terms of the results to be achieved...without providing the technical features necessary for achieving the result. The desired result is crosslinked carbon nanotubes. This is achieved by 1) starting with carbon nanotubes and 2) irradiating them with microwaves as stated clearly in claim 1. Irradiation of carbon nanotubes with microwaves is the technical feature that solves the problem of how to crosslink the carbon nanotubes.

In response, WO '903 teaches using electromagnetic radiation, such as microwaves or light to irradiate nanostructures, excited electrons are produced (page 9, lines 19-20). This reads on the 1) starting with carbon nanotubes and 2) irradiating them with microwaves. Thus, WO '903 teaches the technical features necessary for achieving Applicants' desired result.

**V. Claims 8-9, 11-12 and 18** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **WO 01/75903** ('903).

The rejection of claims 8-9, 11-12 and 18 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 01/75903 ('903) is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed



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to be persuasive.

**VI.** Claims **1 and 7** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **KR 2002-0046342 ('342)**.

*102(b)*

The rejection of claims 1 and 7 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over KR 2002-0046342 ('342) is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the following reasons:

Applicants state that KR '342 does not teach crosslinking CNTs, but rather teaches using a helical carbon nanotube to provide local heating to cancerous tissue.

In response, the Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that not only is this unrelated art, but to even entertain the possibility of crosslinking, more than one CNT must be provided. Thus, KR '342 is not providing carbon nanotubes as disclosed in claim 1 of the present invention. That is, KR '342 provides a single helical carbon nanotube implanted within a tissue (or delivered via nano-size capsule, page 6 paragraph 4) for creating local heating. Thus, although KR '342 teaches irradiating with microwaves, a single helical CNT can't crosslink when other CNTs are not provided and thus, no crosslinking is observed.

In response, KR '342 teaches providing carbon nanotubes. See page 8, Figure 1. More than one microscopic coil of carbon nanotubes is shown to be irradiated at one time.

Applicants state that to establish inherency, extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the device or system described in the reference, and that it would be so recognized by persons of ordinary skill in the art. *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999).

In response, since KR '342 teaches irradiating the microscopic coil of carbon nanotube with electromagnetic waves which includes microwaves (page 4, lines 3-7 and lines 18-24;; and page 8, Figure 1). This reads on the step of irradiating the provided carbon nanotubes with microwaves as presently claimed, being that the claim limitation of "to yield a plurality of crosslink carbon

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nanotubes” is a result of performing this step and does not contribute to the operation of the irradiating. Thus, one having ordinary skill in the art would have expected that similar processes can reasonably be expected to yield products which inherently have the same properties.

Furthermore, the missing descriptive matter is not a claim limitation that contributes to the operation of the irradiating step.

Applicants state that inherency may not be established by probabilities or possibilities; the mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency. *Scaltech, Inc. v. Retech/Tetra L.L.C.*, 156 F.3d 1193, 51 USPQ.2d 1055 (Fed. Cir. 1999).

In response, KR '342 teaches the technical features necessary for achieving Applicants' desired result.

103(a)

Applicants state that KR '342 teaches local heating in cancerous tissues using irradiation of a helical carbon nanotube delivered to the tissue. Modification of KR '342 to crosslink carbon nanotubes would first require providing multiple nanotubes and assuring that these tubes were in proximity to each other for effective crosslinking. Such crosslinking teaches away from the intended purpose, since it would alter the ability of the CNTs to provide heat by altering the absorption properties of the CNTs. Furthermore, to optimize crosslinking of the

CNTs to each other, one would not want the CNTs to be in the vicinity of reactive material such as the cancerous tissue.

In response, the Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that a proposed modification cannot change the principle of operation of the prior art being modified, nor can the proposed modification render the prior art unsatisfactory for its intended purpose.

In response, KR '342 teaches irradiating the microscopic coil of carbon nanotube with electromagnetic waves which includes microwaves (page 4, lines 3-7 and lines 18-24;; and page 8, Figure 1). This reads on the step of irradiating the provided carbon nanotubes with microwaves as presently claimed.

The irradiating step of KR '342 is not modified, and thus, its principle of operation is not changed.

The Applicants have a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well

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settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that KR '342 fails to teach all the elements of the present invention.

In response, there is no requirement that all of the elements of the present invention has to be explicitly disclosed by the reference to established a *prima facie* case of obviousness. References are evaluated by what they collectively suggest to one versed in the art, rather than by their specific disclosures. *In re Simon* 174 USPQ 114 (CCPA 1972); *In re Richman* 165 USPQ 509, 514 (CCPA 1970).

**VII.** Claims **8, 11-12 and 18** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **KR 2002-0046342 ('342)**.

The rejection of claims 8, 11-12 and 18 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over KR 2002-0046342 ('342) is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained reasons as discussed

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above.

Applicants' remarks have been fully considered but they are not deemed to be persuasive.

Claim Rejections - 35 USC § 103

I. Claims **5 and 6** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Harutyunyan et al.** (US Patent No. 7,014,737 B2) as applied to claims 1-4 and 7 above, and further in view of **Fliflet et al.** ("Application of Microwave Heating to Ceramic Processing: Design and Initial Operation of a 2.45-GHz Single-Mode Furnace", *IEEE Transactions on Plasma Science*, Vol. 24, No. 3, June 1996, pp. 1041-1049).

The rejection of claims 5 and 6 under 35 U.S.C. 103(a) as being unpatentable over Harutyunyan et al. as applied to claims 1-4 and 7 above, and further in view of Fliflet et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed to be persuasive.

II. Claim **10** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Harutyunyan et al.** (US Patent No. 7,014,737 B2) as applied to claims 8-9, 11-15 and 18 above, and further in view of **Holtzinger et al.** ("Sidewall

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Functionalization of Carbon Nanotubes", *Angew. Chem. Int. Ed.*, 2001, Vol. 40, No. 21, pp. 4002-4005).

The rejection of claim 10 under 35 U.S.C. 103(a) as being unpatentable over Harutyunyan et al. as applied to claims 8-9, 11-15 and 18 above, and further in view of Holtzinger et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed to be persuasive.

III. Claims **16 and 17** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Harutyunyan et al.** (US Patent No. 7,014,737 B2) as applied to claims 8-9, 11-15 and 18 above, and further in view of **Fliflet et al.**

("Application of Microwave Heating to Ceramic Processing: Design and Initial Operation of a 2.45-GHz Single-Mode Furnace", *IEEE Transactions on Plasma Science*, Vol. 24, No. 3, June 1996, pp. 1041-1049).

The rejection of claims 16 and 17 under 35 U.S.C. 103(a) as being unpatentable over Harutyunyan et al. as applied to claims 8-9, 11-15 and 18 above, and further in view of Fliflet et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed

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to be persuasive.

**IV.** Claim **20** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Harutyunyan et al.** (US Patent No. 7,014,737 B2) as applied to 19, 21-24 and 27 above, and further in view of **Holtzinger et al.** ("Sidewall Functionalization of Carbon Nanotubes", *Angew. Chem. Int. Ed.*, 2001, Vol. 40, No. 21, pp. 4002-4005).

The rejection of claim 20 under 35 U.S.C. 103(a) as being unpatentable over Harutyunyan et al. as applied to 19, 21-24 and 27 above, and further in view of Holtzinger et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed to be persuasive.

**V.** Claims **25 and 26** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Harutyunyan et al.** (US Patent No. 7,014,737 B2) as applied to claims 19, 21-24 and 27 above, and further in view of **Fliflet et al.** ("Application of Microwave Heating to Ceramic Processing: Design and Initial Operation of a 2.45-GHz Single-Mode Furnace", *IEEE Transactions on Plasma Science*, Vol. 24, No. 3, June 1996, pp. 1041-1049).

The rejection of claims 25 and 26 under 35 U.S.C. 103(a) as being



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unpatentable over Harutyunyan et al. as applied to claims 19, 21-24 and 27 above, and further in view of Fliflet et al. is as applied in the Office Action dated March 14, 2007 and incorporated herein. The rejection has been maintained for the reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed to be persuasive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

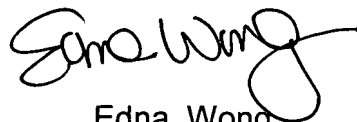
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

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free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read "Edna Wong", with a stylized, flowing script.

Edna Wong  
Primary Examiner  
Art Unit 1753

EW  
May 20, 2007